40 Rock

POPULAR Computing WEEKLY

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This Week

News Desk

Atari in new action

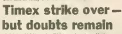
ATARI has continued its campaign against alleged infringements of its rights by taking legal action against Commodore in the US.

A preliminary injunction has been granted to Atari in a case involving possible infringement of patents held by the company. Atari filed suit in October claiming that a joystick controller sold by Commodore in the US for use with the Vic20 computer competes unfairly and is a copy of an Atari design.

Atari won the injunction after a hearing before Federal judge Robert Owen, held in the southern district of New York. In so doing Atari has forced Commodore to stop manufacture and sale of the Vic20 add-on.

Commodore chairman Irving Gould, commented "We sold a very small quantity of the joystick controller and discontinued its sales four months ago because it was not profitable."

No date has so far been fixed for a hearing of the full trial.



Clive Sinclair ready to review Timex contracts

Timex strike over — but doubts remain

PRODUCTION of the ZX81 and ZX Spectrum microcomputers has been restarted at the Timex plant in Dundee following an eight day strike.

About 3,500 of the factory's 4,000 employees, including all assembly line and maintenance workers, had been on strike since November 10. They agreed to return to work on November 18.

The strike was called after the suspension of five men at the plant. With most of Sinclair's ZX81 and Spectrum micros being assembled in Dundee, the stoppage had serious implications for the company.

"The strike happened at a bad time for us," said a Sinclair spokesman. "We were confident that in the short term, we had sufficient supplies but it was very frustrating given that we had only just been able to clear our

Continued on page 5

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This Week

Editorial

Micros and the disabled are, at first sight, an odd juxtaposition of man and machine Why, after all, should someone who is mentally or physically handicapped want to play Space Invaders?

Yet the link between micros and the disabled is not really so surprising Microcomputers can enable the handicapped to forget about their disabilities for a while In some cases micros can even be used to help the disabled to overcome some of their limitations

More importantly, perhaps, micros treat all their users the same The colour of your skin, the number of your arms and legs even your ability to speak, matters not to the micro

Many of the problems suffered by the disabled are worsened by the attitudes of those around them All too often, handicapped people are regarded as being mentally sub-normal simply because they are physically handicapped

Most people, for example, on meeting a disabled person in a wheelchair will talk to whoever is pushing the chair, rather than to the person who is sitting in it

It is a sad reflection on the world we live in that micros can seem more humane to the disabled than their human counterparts

Next Thursday

Have you got what it takes to be an astronaut? Could you pilot a spacecraft through the solar wind? Find out in Lunar Lander — the definitive game for 16K Spectrum and 1K ZX81

Also next week a tape index program for the Vic20 by John Ingham and a survey of Atari software

Timex strike comes to an end

Continued from page 1

Spectrum order back-log "

Stocks of the ZX81 machines are probably quite substantial since for some time production has exceeded UK demand and a large proportion are exported

Since the strike began the only Spectrum microcomputers being manufactured have been those assembled by Thorn/EMI subsidiary Datatech at Feltham Thorn/EMI began assembly in September as a second source to reduce the then lengthening delivery times on Spectrum orders

Sinclair Research is currently investigating alternative manufacturing arrangements

Clive Sinclair had commented that if the strike was prolonged then the Timex contracts would have to be reviewed

A Sinclair spokesman said "We are currently involved in serious discussions with other manufacturers It would obviously be a very major move to switch our production from Timex, but we also have to be prepared to act if necessary We do regard the situation, resulting from circumstances completely beyond our control, as very serious "

Timex has two plants in Dundee If Sinclair were to take their manufacturing contracts elsewhere there is concern that Timex would be forced to close one of its sites leading to possible redundancies

Computer show

THE Which Computer? show is being held at the National Exhibition Centre Birmingham, on January 18-21 Entrance costs £3 and is limited to over 18s only For more information, telephone 01-747 3131

Prestel service to be expanded

BRITISH Telecom is to extend the areas of the country where its Prestel service can be received

Work to be completed by the start of 1984 will mean that 92 percent of telephone users will be within a local call of the Prestel scheme At present only 62 percent can access the system at low cost

Lynx leaps into High Street

THE much awaited Lynx microcomputer is to go on sale in high street stores in the second week of December

Camputers' micro will be stocked by Dixons Laskys and Spectrum Computer Centres, following agreements reached last week A large proportion of Dixons shops about half Laskys outlets and all the 60 Spectrum Centres will be selling the Lynx

Michael Stern Chairman of the Spectrum Group, commented ' Our technical people think it is a very fine machine at the right price It is British made and it has got everything going for it "

The first batch of 3,000 machines is now being assembled and will be ready for testing by the end of November Production is planned to continue at 3,500 units per month, but will be increased if demand for the micro is sufficient The Lynx will sell for £225 including VAT

Stacking the deck for Vic

STACK Computer Services has produced a 40/80 column card for the Vic20 microcomputer

It enables programs to be written and executed in either a 40 or 80 column format while retaining the full Vic character set The card is intended mainly for word processing applications and displays in black-and-white Full editing, as on the standard Vic display is possible with both upper and lower case characters graphics symbols and reversed field

Stack s Roger Parkinson explained "The card contains a Rom sitting in the auto-start position so that, when you switch on your Vic it overwrites the 22 column Vic screen and generates its own complete memory mapped screen "

Because of the way the card has been designed the Stack 40/80 screen and the standard Vic screen are held in different areas of Ram It is possible to program data to appear on either screen, although a second tv is required to view the 22 column Vic display On the Stack screen it is possible using simple key combinations to switch between the 40 and 80 column display modes

Stack s 40/80 column card

The Stack 40/80 column card which can be used with the unexpanded Vic and with most expansion options is priced at £115 including VAT

The add on has been accorded official Commodore approval and will initially only be available to VicSoft members It will be available for normal Commodore retailers from December 31

Thorn/Emi forms computer division

THORN/EMI has combined its information technology interests to form a single division to concentrate on computer services Colin Southgate has been appointed as chief executive of the new IT division

The company is expanding rapidly into the computer field, following its acquisition of Software Sciences and Datasolve from BOC earlier this year and the success of its Datatech subsidiary

Within the last 10 weeks it has taken over some manufacturing and assembly work on the Sinclair ZX Spectrum and has also produced software for the Atari and Vic20 machines

New Acorn micro held back until '83

ACORN S new Electron microcomputer will not now go on sale until next year

'The company has, if you like, grown up commented an Acorn spokesman 'The machine will not be offered for sale until we have built up substantial stocks The Electron is ready apart from the ULAs and, as we have discovered in the past the time that will take is anybody s guess

Planned to sell for around £150 the new machine will feature a calculator type keyboard (similar to that on the Sinclair Spectrum) 32K Ram and graphics capabilities similar to Acorn s BBC Model B micro

The Electron was originally scheduled for launch before Christmas

And then there were three

ORIC Products has announced that a third version of the Oric 1 microcomputer is to be produced

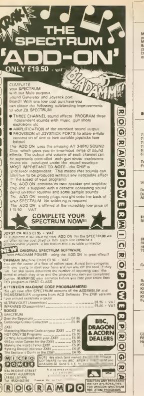
A 32K model will now join the planned 16K and 48K versions The machines, in order of memory size will cost £99 95 £139 95 and £169

Possum's help for handicapped

ONE of three versions of the Spectrum microcomputer designed to help the physically disabled

The machines have been developed in collaboration with Sinclair Research, by Possum Controls, specialists in aids for the disabled The Expanded Keyboard model (above), has been produced for people with gross movement or tremors

Other versions use a light to scan a replica of the Spectrum keyboard to select keys


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LETTERS

Moody Blues Instrumental

Clive Sinclair has really started to rub salt into the wounds with his new "Musical Answering Machine" Last week, I telephoned twice, the first time I was serenaded with "It's Impossible" and the second time it was "You Are The Sunshine Of My Life!"

All readers will now want to think up their own ideas for songs which they feel may sum up the true Sinclair How about — "I Can't Get No Satisfaction"? Remember also "Yesterday Man?"

G C Smith
94 South End Road
Rainham
Essex

Pie in the sky when you die

I have just read your editorial (November 4) and I couldn't agree with you more! I received my Spectrum on October 30 at 1 50 pm On October 31 at 9 00 pm I was in the middle of programming it when the screen went blank and my Spectrum joined it's many brothers in the Great Computer Room in the sky

So, after 17 weeks wait I had my Spectrum alive and working for less than two days I know that things aren't meant to last these days, but incorporating a self-destruct mechanism that activates after a few hours is going a bit far, don't you think? Or has "Uncle Clive" been watching too many "Mission Impossible" videos

Seriously though as a programmer by trade I know computers have teething problems but this is turning into a farce and a very unfunny and painful one at that It will take more than a free cassette and a voucher for ZX printer paper (as if I would ever trust Sinclair with my money again) to compensate me for the feeling of utter disappointment and then anger when my Spectrum died Up until then I was very pleased with it and thought it almost worth the 17 weeks wait

I suppose I will have to wait weeks for a replacement now Still, it will make a nice new-year present for me

B J Lowry
63 Cavendish Crescent
Hornchurch
Essex

With a crack of the whip

While there is still time, I claim to have cracked the Sinclair micro-drive problem One track spiral in like gramophone record

L Hewson
35 Haroldslea Drive
Horley
Surrey RH6 9DT

Angling into correct formulae

In your issue dated October 28, Andrew Esmond's formulae are incorrect They only work for a rotation of 45° as sin 45° = cos 45° Any other angle put through his formula gives some very obscure graphics The correct formulae are

$x = x\cos\theta - y\sin\theta$
$y = y\cos\theta + x\sin\theta$

Here is a program for the Spectrum which allows a cube to be rotated in three directions using *Inkeys*

6 — around
7 — up
8 — right

I have also improved the perspective so that there is a continuous decreasing in scale for any value of *z* Variable *RO* is the angle through which the cube is rotated and *s* is its size Deleting line 1010 can give some very interesting graphics

A Howes
23 The Hazels
Wigmore
Gillingham
Kent ME8 0SE

```
   1 PAPER 0: INK 8: BORDER 2
   2 POKE 23609,50
  10 LET s=35
  12 LET ro=15/180*PI
  30 LET MX=255: LET MY=175
  50 LET CX=MX/2: LET CY=MY/2
  70 DIM X(8): DIM Y(8): DIM Z(8)
  80 DIM A(8): DIM B(8)
 100 LET N=8
 140 LET X(1)=s: LET X(2)=s: LET
X(3)=-s: LET X(4)=-s: LET Y(1)=s
4 LET Y(2)=-s: LET Y(3)=-s: LET
Y(4)=s
 220 FOR F=1 TO 4
 230 LET X(4+F)=X(F)
 240 LET Y(4+F)=Y(F)
 250 LET Z(F)=s
 260 LET Z(F+4)=-s
 270 NEXT F
 300 GO SUB 1010
 310 IF INKEY$="" THEN GO TO 310
 320 IF INKEY$="6" THEN GO SUB 1
 340 GO SUB 1010
 330 IF INKEY$="7" THEN GO SUB 1
 140 GO SUB 1010
 380 IF INKEY$="8" THEN GO SUB 1
 240 GO SUB 1010
 400 GO TO 310
1010 CLS
1011 FOR F=1 TO 8
1020 LET SF=150/(Z(F)+150)
1043 LET X=X(F)*SF+CX
1050 LET Y=Y(F)*SF+CY
1060 IF (X>MX OR X<0) OR (Y>MY O
R Y<0) THEN GO TO 1090
1070 LET A(F)=X: LET B(F)=Y
1090 NEXT F
1095 GO SUB 2000
1099 RETURN
1140 FOR F=1 TO 8
1177 LET y=y(f)*COS ro-z(f)*SIN
ro
1178 LET z=z(f)*COS ro+y(f)*SIN
ro
1180 LET y(f)=y: LET z(f)=z
1190 NEXT F
1200 RETURN
1240 FOR F=1 TO 8
1277 LET x=x(f)*COS ro-z(f)*SIN
ro
1278 LET z=z(f)*COS ro+x(f)*SIN
ro
1280 LET x(f)=x: LET z(f)=z
1290 NEXT F
1310 RETURN
1340 FOR F=1 TO 8
1377 LET x=x(f)*COS ro-y(f)*SIN
ro
1378 LET y=y(f)*COS ro+x(f)*SIN
ro
1380 LET x(f)=x: LET y(f)=y
1390 NEXT F
1410 RETURN
2010 PLOT A(1),B(1)
2020 DRAW A(2)-A(1),B(2)-B(1)
2030 DRAW A(3)-A(2),B(3)-B(2)
2040 DRAW A(4)-A(3),B(4)-B(3)
2050 DRAW A(1)-A(4),B(1)-B(4)
2060 PLOT A(5),B(5)
2070 DRAW A(6)-A(5),B(6)-B(5)
2080 DRAW A(7)-A(6),B(7)-B(6)
2090 DRAW A(8)-A(7),B(8)-B(7)
2100 DRAW A(5)-A(8),B(5)-B(8)
2110 PLOT A(5),B(5)
2120 DRAW A(1)-A(5),B(1)-B(5)
2130 PLOT A(6),B(6)
2140 DRAW A(2)-A(6),B(2)-B(6)
2150 PLOT A(7),B(7)
2160 DRAW A(3)-A(7),B(3)-B(7)
2170 PLOT A(8),B(8)
2180 DRAW A(4)-A(8),B(4)-B(8)
2990 RETURN
3000 FOR f=1 TO 8: PRINT x(f),y(
f): NEXT f
```

Programming for real uses

At last somebody has put into words my thoughts on computers in the home I am of course, referring to your editorial of October 14 You say that we are uncertain of how computers can be used in industry commerce and the home Well computers are being used increasingly for real applications in industry and commerce But few if any, computers are being used in the home for anything but games machines This must be better than using dedicated games machines such as Atari and Intellivision as the users of home computers will also get experience of programming

The number of really useful programs for the home computer owner can probably be counted on the fingers of one hand I exclude from the term 'useful', the numerous home accounts and telephone index programs, which are really a poor substitute for pencil and paper

However in the very same issue you published two excellent utility programs for the Spectrum But you awarded the 'program of the week' accolade to yet another game

It is up to somebody such as *Popular Computing Weekly* as one of the most widely, and certainly the most frequently read of all home computer magazines to invite your readership to submit ideas and programs for real uses in the home Hopefully this will stimulate more thought and invention in this field thus really bringing us into the computer age, by making it a tool and not a toy

PS Thank God Citizen Fain has gone, but I have noticed lately that A R T H U R is getting rather boring

A Maclure
5 Kynaston Place
The Grove
Witham
Essex CM8 2UA

Our sentiments exactly, though do not forget that games can be fun

We are always on the lookout for real applications for home micros, as well as for games

So, if you have an excellent utilities program, or a novel application, now's your chance to send it in



A new game for 16K Spectrum

by Mike Moscoff

YOU control a laser station protecting a moon base from the dreaded Kruge. The Krugs traditionally evil have vowed to wipe out all Yoomens

When run the program displays brief instructions. Reply 0 or 1 to the query about difficulty level required. Wait one minute while variables are assigned and the screen is drawn

The game starts with a bleep. Use keys 5, 6, 7 and 8 to move your sights (left, down up and right). Use keys 0 or 1 to fire. The game ends when all your power is gone

How it works

900-998	Displays the instructions
700-790	Sets up all variables and defines special characters
800-850	Draws the screen
70	Prints the score
100-140	Moves your sights
150-190	Fires yours laser
200-230	Explodes alien if hit.
300-340	Moves the alien
343	Fires the alien laser
200-300	Sets up a new alien
600-640	End of game routine

To test the program, first enter lines 30 35, 45-220 700-790, 870-890 and Run. This should define all variables print score, move your sights (keys 5-8) and fire the laser (keys 0 1). Then add lines 40 300-385. The alien should move randomly from left to right and hits should be registered. Finally add lines 20 600-690 800-850 900-985

Enhancements

The speed can be improved slightly by

(1) Deleting all Rem statements
(2) Deleting *Beeps* in lines 130 160 175 330 and 343
(3) Deleting all the fancy visuals
(4) Using machine code

The end routine (lines 600-690) could be improved by adding

```
628    LET r$    LET r$= ( try harder AND
       sc<200) + ( well done AND sc>199
       AND sc<400) + ( excellent AND
       sc>399)
638    PRINT AT 18 12 r$
```

Also, a 'High score could be added

```
975    LET hi=0
635    IF sc > hi THEN LET hi = sc PRINT AT
       14 12 HIGH SCORE! AT 15 16 hi
```

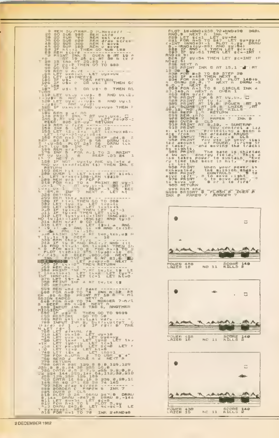
Variables

ux, uy	Sights x y position
uxo uyo	Sights old position
lx ly	Aliens x y position
lxo lyo	Aliens old position
lc	Aliens position change
pu	Power
sc	Score
lz	No of laser bolts fired
lno	No of aliens.
ki	No of kills
df	Difficulty setting
ht	Hit flag
lcx, lcy	Sights plot position
l$	Alien character(s)
u$	Old alien character(s) and *inkey$* response
r$	Your replies

Graphics characters

A	Sights
B	Alien-1
CD	Alien 2
CED	Alien 3
F	Explosion-1
G	Explosion 2



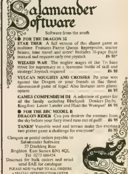


POWER 450
LAZER 10
NO 11
SCORE 140
KILLS 2


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Television micro vision—tomorrow's world today

***David Kelly** visits Thames TV to watch an episode of Database being recorded*

"Stand by studio... we're going for a take on items 1 to 4... can we have a clock? ... stand by VT... 30 seconds... roll VT... 10, 9, 8, 7..."

In the studio control room six pairs of eyes are fixed on the array of monitors. At three the Academy leader is replaced by blank screens. At zero two of them brighten to show the Thames Television signature and at minus five another episode of the six-part computer programme Database begins.

Each Monday finds the production team in Studio 3 in Teddington where the video tape links are recorded which join the show together. Database is a magazine type programme presented by Tony Bastable. Dealing very much in current affairs for computer enthusiasts, the individual items in each programme are put together at the last minute, at the same time as the week's computer news section is recorded. The first part to record is the 'tasters'. These form a short résumé of each programme's content — shown before the main title — to grab the viewer's attention.

The idea for the programme came from Mike Feldman — Database Associate Producer. "I first had the idea for a sort of Computer Club two years ago. Microcomputers were a growth area and I thought about a series aimed at the home programmer. That idea never happened, but instead we made a short series for children's television called 'Living in the Future'. I had an Apple at home which I bought for fun and my kids loved it. I based the series on their reactions.

"About this time Thames perceived the need to be active in information technology and proposed the Database series.

"We were given six half hour slots," he says. "A great deal of research went in to find out what sort of programme was needed — and we came up with two possible formats. We could have a series dealing generally with computers and with applications and problems arising from them. Or we could have a straightforward programme about how to learn Basic.

"We opted for the former — and chose a magazine format to keep the show lively."

"That is where I came in," says presenter Tony Bastable. "My expertise is in the arrangement of magazine programmes.

"Each episode has a central theme — the first was on cable tv, the one we are doing now is on artificial intelligence. Apart from that the whole series has a central philosophy: that it is not for us to come to terms with the computer, but for the computer to come to terms with us! We aim to demystify the computer, and ask some important questions like: Do we need them? What will they do? And do we need what they do?

"I started off — coming from Thames' motoring programme Wheelbase — with a major advantage: total ignorance," grins Tony. "I ask the sort of obvious questions that the experts assume people know.

Tony Bastable (right) – keeping his feet on the ground

Database goes out at 11.30 pm on Tuesday evenings on Thames (it is not networked nationally as yet) and at that time of night you really have to catch your audience.

Designed to grab you in this episode were: "Just how intelligent is a computer? Could it replace the doctor with faster and more accurate diagnoses? Do you need to master a computer language to use the huge amount of information it can store? We report on the clergyman who uses *Space Invader*-type games to teach the bible. And if you use the mix facility on your Teletext-equipped television you'll be able to superimpose new pages of information available on Thames' new Oracle service which starts today."



Micros in focus

When I first started work on the series I thought: Why not explain how it works — like you can a carburettor on a car? How does the signal get from A here to the microchip B over there? It was then I discovered it wasn't that easy. Not only could very few people using microcomputers begin to say how they worked — but they didn't care! You put A in here and B comes out there, what goes on in the middle is a complete mystery, but it doesn't matter.

"The important thing, I think, is never to let your feet leave the ground. To never get carried away with the wonders of science and lose sight of the everyday practicality of things. When we went to that dreadful computer controlled house in Milton Keynes it had a tv screen on which you could leave messages. I wrote on it 'Gone to lunch' and pointed out that you could just as well use a pen and paper. If something isn't very good we have said so, but everybody gets a fair crack of the whip.

"One of the things we decided when we started was that we would only consider today's world. Database is a *current* affairs technology programme."

"It has been a long hard slog for us to get Database put on," says Mike Feldman. "Both our series and the BBC's Computer Programme have suffered from scheduling at strange times — the difficulty is to prove that such a programme can attract an audience.

"I hope we have managed to produce a show that is enjoyable to watch. It is difficult to judge audience reaction but the reviews have been favourable and our ratings are going up. We have established that information technology can be both interesting and good television.

"The most important thing to have come out of our series has been the next one. We have been given the go ahead to do 12 programmes next year.

"What we want," says Mike, "is one programme per month, networked nationally at 7.00 peak viewing time — but we will have to wait and see!" ■

Dragon quest

***John Scriven** breathes fire into some of Dragon's latest software*

Since its appearance in the summer sales of the Dragon have soared The reasons why are fairly clear — it offers 32K Ram, colour sound, the latest Microsoft Basic and most importantly it is available at hundreds of retail outlets up and down the country Along with the machine Dragon Data has released a wide range of software that is available from the same retailers

It was not until many months after the ZX81 appeared that Sinclair produced his own software "Official" Spectrum programs are only just coming on to the market Acorn also waited for some time before producing BBC software In this respect Dragon Data has learned from the experience of previous manufacturers and has attempted to get an early foothold in an important market

The programs can be divided into two groups cartridges and cassettes The cartridges slot neatly into the side of the Dragon and are running within seconds each time every time, so are ideal for instant games They do however, appear to be rather expensive at £19-£25 although this is a feature shared with Vic and Atari cartridges

Most of the cartridges contain two single rail Eproms in a well-constructed box that small fingers will not be able to pry apart and do not wobble when inserted like certain infamous Ram-packs In defence of the price, it must be admitted that were you to design your own pcb burn Eproms etc then the hardware alone would probably be in excess of £10 You get what you pay for, and in this case it is reliability, ease of loading and no fiddly leads and cassette levels

The cartridges are all arcade-type games and several need joysticks to play *Meteoroids* is a version of *Asteroids* with one or two advantages over similar games Firstly the skill level is selectable (0-15) as is the number of joysticks employed Secondly the movement of your spacecraft tends more towards Newton's laws of motion than most variants which makes the game more difficult — it is easy at higher skill levels to be sent flying off the screen at an uncontrollable speed

The object of the game is to destroy as many meteoroids as possible before being zapped yourself by deadly flying saucers Individual and best scores are shown in a league table My one small criticism is that the display is in black and white (or buff as Dragon Data calls it) It's a pity the game could not have been written in a different mode utilising a wider colour range At least it does not use the rather emetic green that is the default colour when you switch on

Cosmic Invaders is the standard *Invaders* arcade game that I will not bore you with by describing (Can there still be people left in the country who don't know the game?) I presume Dragon Data felt their patrons would feel left out if they did not include it in their catalogue but this is hardly a sparkling version and is not too difficult to master

Starship Chameleon can be played by one or two players and involves destroying enemy rockets by colliding your own craft with them The interesting difference is that some craft are made of matter and some of anti-matter If you do not select the correct status of your ship (using the "fire" button on the joystick) you will explode Matter/anti-matter states are shown by blue/yellow colour changes

Red missiles that are "smart", ie home in on you, add to the challenge of the game Skill levels from 1 to 9 may be selected and scores are shown on screen My criticism of this game is that the background colour is green and the scores do not show up as well as they might

There are two cartridges of the maze-pursuit variety although they are different enough from the original to avoid threats of legal action flying to South Wales from America

Cave Hunters presents you with a cave maze always the same with four bars of gold at the base The odd cave hunter has to collect them one at a time and deposit them outside the cave It is not as simple as this however Lurking in the cave are creatures who eat you up after pursuing you through the caverns unless you've just passed over a power pack when you can for a few seconds destroy them This game is entertaining and more difficult than it at first appears

Ghost Attack is a rather more familiar game of gobbling up proton pills in a maze while avoiding the attentions of three ghosts (unless you've recently passed over an "energiser") There are three levels of difficulty, "easy" "hard" and "tuff", and it's certainly fun to play but you may wonder as I did if it is indeed worth £5 more than the other cartridges

Berserk the last cartridge is based on a popular arcade game that does not often appear in a version for home computers Again, it is a shame that the Dragon palette is so limited in high resolution modes that it only appears in black and white You control a small man in a series of large inter connecting rooms Robots inhabit the maze and you have to destroy them while avoiding their lasers and the electrified walls As you move off the edge of the screen another series of rooms appears There is also the complication of "Evil Orville", a smiling bouncing ball who cannot be destroyed This cartridge is great fun and the graphics are very good

There are eight cassettes available They cover home finance utility packages, adventure and general games The first, *Special Selection 1* contains four games that are designed to tax brain and memory power rather than hand/eye co-ordination as do the arcade cartridges



Some of the cartridges from Dragon Data's software range

Brain chooses two characters from the keyboard and awards or removes points as a clue to how close you are to success. This will make your brain ache states the screen — a reasonably accurate statement until you begin to work out strategies. *Four* is a version of *Connect Four* played by two players on a large grid — in fact a larger version of noughts and crosses. A reasonable game but rather simple graphics.

Horse is hardly educational unless you need to be shown the foolishness of allowing animals to control your cash flow. Up to nine players can bet on their choice and the computer uses pretty graphics to show the race in full colour. *Simon* is the familiar sound memory game that increases in difficulty by giving you more and more notes to recall in the correct order. Coloured dragons act as an aide memoire.

As a cassette *Special Selection 1* offers good value containing four reasonable games. The notes state look in the listings to get ideas for your own programs and also find how to program for particular effects. It is a pleasant surprise to find games software being put to instructional use and increases the value of the cassette enormously.

Examples from the Manual is just what it says — 50 or so small demonstration programs. It seems to rather defeat the object of learning by working through the manual but if you hate typing then you may find some use for this cassette.

Graphic Animator uses joysticks to draw designs on the screen and load them into the page memory. The pages can then be flicked through at a chosen rate to give a cartoon effect. The idea is superb but the joysticks are hypersensitive and the drawing routine so fast that the results are not as clear as would be wished even with practice and a steady hand. As it is written in machine code it is not possible to alter from the keyboard so I hope that Dragon Data will rewrite this program as the idea is worth developing. At present however this cassette does not represent such good value.

Personal Finance is a home money management package consisting of three programs. *Family Budget* uses Dragon's

DRAGON 32

cassette filing capability to keep track of incomes, standing orders, etc and allows you to follow the state of your balance. It is more useful than relying on your bank. My manager always waits until the eleventh month before informing me now overdrawn my budget account is!

Family Accounts uses one data file to handle up to 20 accounts. This program, although necessarily limited, does demonstrate the possible future use of the Dragon in small business applications particularly when the larger memory becomes available.

Family Address also uses a single data file to hold up to 80 names addresses and phone numbers. The program finds names swiftly and if you cannot spell will patiently go through all the entries starting with a particular letter. The business potential is again demonstrated, but it did occur to me that it was still a lot quicker to look up numbers in my address book. All three programs are menu-driven and the cassette is good value.

Special Selection 2 also uses the file handling system in a couple of programs *Database* and *Dragon*. Another program *Index* shows how two files can be manipulated. *Dragon* is a rather weak version of *Hangman* but does show how different words may be loaded separately which would be a useful facility in an educational situation.

The best program on the cassette however is *Music*. This prints out a stave and allows you to enter notes play them alter their time and pitch values and even store them as data on a tape to be incorporated in your own programs. Another tape that is good value for money.

Computevoice is quite an amazing tape. When I first acquired a Dragon I was disappointed with the sound — it is not as steady and pure as the amplified Spectrum sound and can in no way compete with the sophisticated BBC facilities. I therefore viewed this cassette with some suspicion.

A machine code routine contains the working section and can be incorporated in your own programs to sneer at inferior games players or encourage children using learning packages. There is a demonstration program in Basic that will speak the numbers one to nine as you press the relevant keys. The quality cannot approach the standard of specialist hardware like Mutek's Voxbox or any of the Texas speech synthesisers but at less than £8 it offers excellent value.

It also teaches the principles of phonemic voice production. In other words it is no good typing in 'FIVE' as a speech string or you get something like "FEVEH". If you enter 'F<16EV' then it is almost recognisable. As with all Dragon software the documentation is excellent and the tape is easier to use than may appear from the above.

I have left the two adventure programs until last as I have to admit to being an addict to this sort of program. *Quest* contains elements of *Kingdom* as well as *Adventure*. You start off with 10 men an assortment of equipment and the objective of storming Moorlock's Citadel.

A map of your progress appears and reveals ruins caves and castles as well as gangs of soldiers wizards pilgrims and ogres as the game progresses. You can be friendly towards these groups run away or fight them. This is the way to increase the size of your army until it is sufficiently large to attack the Citadel. Various pieces of equipment can be acquired in this way or by haggling for them in several cities you can visit. I will say no more — this game is very entertaining and is likely to prove a favourite longer than many of the arcade games.

Madness and the Minotaur is a purely textual adventure (ie no graphics). The object is to explore a labyrinth, collecting treasures and avoiding monsters by using spells and objects you may encounter on the way. It is well thought out, rather difficult and, as with *Quest* it is the sort of software that needs a Government Health Warning on the side. If you can cope with the prospect of struggling through the tunnels until 3 am then you will certainly enjoy this cassette. My one criticism is that you cannot *Save* the game during play so it's necessary to start from the beginning each time.

That concludes the first dip into the Dragon's lair. Many more software houses are starting to produce programs for this machine. Apart from a few minor points, Dragon Data has set a high standard for the others to follow. ■

Cartridges	Joystick	Cost*	Value (1-10)
Berserk	Y	£19 95	8
Meteoroids	N	£19 95	7
Cosmic Invaders	N	£19 95	8
Ghost Attack	Y	£24 95	7
Cave Hunter	Y	£19 95	8
Starship Chameleon	Y	£19 95	7
Cassettes			
Dragon Special Selection 1		£7 95	8
Dragon Special Selection 2		£7 95	9
Quest		£7 95	9
Madness and the Minotaur		£7 95	8
Graphic Animator		£7 95	5
Computevoice		£7 95	9
Examples from manual		£7 95	5
Personal Finance		£7 95	9

*Cassettes usually these prices — Cartridges available at up to 10 per cent discount at some outlets

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £6 for each program published.

Colour Graphics

on Vic20

Multicolour graphics is a function which has not really been explored to the full on the Vic20 computer. Since this function is easily accessible I decided to write a program to demonstrate it.

My program is one of moods. It begins with a gentle mixture of red and white on a plush red background. The feeling here is one of calm and tranquility. This is swiftly followed by a profusion of much stronger colour in multi-colour mode startlingly beautiful in its complexity.

The flashing effect appears to become more pronounced with the addition of sound which starts half-way through at a fairly low pitch and builds up into a crescendo, ending in a resounding crash. Of course there is no actual difference in the power of the swiftly-changing graphics despite the illusion, but the effect on the viewer is one of exciting expectancy.

After this mind-blowing interval the mood once again reverts to the sudden calmness of slowly-changing colours. This signifies the end of the program but my inclusion of a *Goto* enables the program to re run itself automatically.

An escape may be engineered by depressing any key during the colour sequence on the green background. This brings about a crashing sound and the program is at an end.

Program notes

Line(s)	
100 to 140	Set up sound registers
150	Print title
151	Set up Graphics Mode
152 to 153	Set up foreground/background colours and multi-colour Mode
220	Choose random colour for the square
310	Provide user with an escape from the program
490 to 600	Define Graphics characters
1000 to 1050	Choose Graphics characters to be displayed
2050 to 2500	Subroutine to place characters or colours on to screen
4000 to 4010	Crash subroutine

```
100 POKE36874,0
110 POKE36875,0
120 POKE36876,0
130 POKE36877,0
140 POKE36878,0
150 POKE36879,42 PRINT"** VIC KALEIDOSCOPE **" FORI=1TO2000 NEXT PRINT""
151 POKE36869,255 GOSUB490 GOSUB1000
152 POKE36879,29
153 POKE646,10
180 Z=38400 Q=Z+21
190 E=Z+484 R=Z+505
200 FORJ=0TO10
210 FORI=0TO12
220 X=INT(RND(1)*8+INT(RND(1)*8+1))
230 GOSUB2050
310 GETA$ IFA$<>""THEN350
320 NEXT
330 FORK=1TO200 NEXT
335 NEXT POKE36878,15 FORI=0TO240 POKE36879,I
340 FORJ=0TO125 NEXT POKE36876,I GOSUB3000 POKE36875,I POKE36874,I POKE36877,I
350 NEXT GOSUB4000 POKE36879,29 PRINT"" POKE36879,27
360 POKE36869,240 END
490 POKE56,28 POKE52,28 RESTORE FORI=0TO39 READA POKE7168+I,A NEXT
500 DATA0,0,0,0,0,0,0,0
510 DATA240,240,240,240,15,15,15,15
520 DATA255,129,189,165,165,189,129,255
530 DATA255,61,61,61,61,61,61,255
540 DATA170,170,170,170,170,170,170,170
550 FORI=7208TO7215 POKEI,INT(RND(1)*255+1) NEXT
600 RETURN
1000 Z=7680 Q=7680+21
1010 E=7680+484 R=7680+505
1020 FORJ=0TO10
1030 FORI=0TO12
1040 X=INT(RND(1)*5+1)
1050 GOSUB2050 NEXT NEXT RETURN
2050 POKEZ+J*23+I,X
2060 POKEQ+J*21-I,X
2070 POKEZ+J*23+I*22,X
2080 POKEQ+J*21+I*22,X
2090 POKEE-J*21+I,X
2100 POKER-J*23-I,X
2110 POKEE-J*21-I*22,X
2120 POKER-J*23-I*22,X
2500 RETURN
3000 POKE36878,INT(I/15) RETURN
4000 POKE36874,0 POKE36875,0 POKE36876,0
4001 POKE36879,29 POKE36877,200 FORI=
     15TO0STEP-.1 POKE36878,I FORJ=0TO20
     NEXT NEXT
4010 POKE36877,0 RETURN
```

Colour Graphics
by William Stenning

Astsroids

on BBC Micro

The game for the A and B model BBC computer system runs in MODE 5 with full colour sound and user definable graphics

The day's high score and your score are displayed after each game

Full Instructions are enclosed in the listing. The game uses VDU5 with fast-moving graphic action. High scores, so far, range in the 3000s. The game is addictive (according to my class mates)

The general idea of the game is to collect as many aliens as possible and to deposit them in their yellow bases. Collision with the red asteroids ends the game. This listing works perfectly and will provide a challenge to other readers

```
5 H%=0:S%=0
10 GOTO550
20 ENVELOPE1,1,-5,5,-5,20,20,20,50,-25,0,-20,100,60
30 MODE5:A=500:SC=0:VDU19,3,2;0;
40 VDU23,255,248,252,255,127,63,60,60,60
50 VDU23,254,60,63,126,255,127,63,62,60
60 VDU23,253,60,124,126,127,255,254,63,60
70 VDU23,250,24,24,60,60,126,126,66,66
80 VDU23,240,60,126,219,255,255,66,126,60
90 VDU23,241,63,127,255,255,255,255,127,63
100 VDU23,242,252,254,255,255,255,255,254,252
110 G=0:PROCSHIP
120 VDU4
130 COLOUR1:PRINTTAB(RND(20),1);CHR$(RND(3)+252)
140 IFRND(1)>.9THENPROCMAKE
150 IFRND(1)>.95THENPROCMAKED
160 VDU30:VDU11
170 VDU5
180 A$=INKEY$(0)
190 IFA$="Z"ANDA>50THENA=A-48
200 IFA$="M"ANDA<1150THENA=A+48
210 *FX11,1
220 *FX15,0
230 SOUND1,1,100+(SC*5),100
240 IFPOINT(A+32,208)=1THENPROCDESTROY
250 IFPOINT(A+32,208)=2THENPROCDROP
260 IFPOINT(A+32,208)=3THENPROCALIEN
270 G=2:PROCSHIP:S%=S%+1
280 GOTO110
290 DEFPROCSHIP
300 GCOL0,G:MOVEA,200:PRINTCHR$(250)
310 IFSC>0THENMOVEA,144:PRINTCHR$(240)
320 ENDPROC
330 DEFPROCDESTROY
340 VDU4
350 FORA=1TO15:SOUND0,1,A*2,A:NEXT
360 *FX11,0
370 PRINTTAB(10,10);SY
380 *FX15,0
383 IFS%>H%THENH%=S%
390 G$=GET$:GOTO550
400 ENDPROC
410 DEFPROCMAKE
420 COLOUR3:PRINTTAB(RND(20),1);CHR$(240)
430 ENDPROC
440 DEFPROCMAKED
450 COLOUR2:PRINTTAB(RND(18),1);CHR$(241);CHR$(242)
460 ENDPROC
470 DEFPROCALIEN
480 S%=S%+10
490 SC=SC+1
500 ENDPROC
510 DEFPROCDROP
520 S%=S%+(SC*50)
530 SC=0
540 ENDPROC
550 CLS:CLEAR
555 MODE7
560 PRINTTAB(12,2);CHR$(129);CHR$(141);"SALVAGE"
565PRINTTAB(12,3);CHR$(129);CHR$(141);"SALVAGE"
570 PRINTTAB(11,4);CHR$(129);"___________"
580 PRINTTAB(2,6);CHR$(130);"The idea of the game is to collect as"
590 PRINTTAB(1,7);CHR$(130);"many aliens as possible and take them"
600 PRINTTAB(1,8);CHR$(130);"back to thier yellow bases.The only"
610 PRINTTAB(1,9);CHR$(130);"problem is, that if you hit the"
620 PRINTTAB(1,10);CHR$(130);"asteroids, you blow up."
630 PRINTTAB(12,12);CHR$(133);CHR$(136);"Z M"
640 PRINTTAB(10,14);CHR$(134);"HIGH SCORE ";H%
650 PRINTTAB(10,16);CHR$(134);"YOUR SCORE ";S%
660 PRINTTAB(6,20);CHR$(131);CHR$(136);"Press any key to start"
665 S%=0
670 G$=GET$:GOTO20
```

Asteroids
by Duncan Worrell

Bin/dec

on ZX81

This program will convert decimal numbers into binary numbers and vice versa. You are told which letter to enter for the function you need. After you have made your choice the screen is cleared and the program continues with the function you wish.

What the function does is displayed at the top of the screen. Then the number you want is calculated and printed. The program then pauses. Pressing any key will re-run the program.

Program notes for decimal to binary

60 to 70 reserve space for A$ and B$
80 waits until a number is input
90 lets X = your input number so that at line 170 Y is your original number
100 halves your number
110 to 115 check the remainder of the result of line 100 and allocates the correct binary digit to A$
120 removes the remainder after the division in 100
130 checks to see if the number has been converted to binary
140 to 160 lets B$ = A$ but in reverse to get the correct binary number
170 prints the decimal number and its equivalent in binary

Program notes for binary to decimal

200 waits for you to input your binary number
210 the decimal counter is set to zero
220 sets up a loop counter as long as the binary number you have input
230 searches for the digit 1 in your binary number. If it finds one it increases the D counter by its equivalent decimal value
240 continues this until each digit has been checked
250 prints its equivalent decimal number

```
10 PRINT "INPUT D FOR DEC. TO BIN."
20 PRINT "INPUT B FOR BIN. TO DEC."
30 INPUT C$
40 CLS
50 IF C$="B" THEN GOTO 190
55 PRINT "CONVERSION FROM DEC. TO BIN."
60 LET A$=""
70 LET B$=""
80 INPUT Y
90 LET X=Y
100 LET X=X/2
110 IF INT X<>X THEN LET A$=A$+"1"
115 IF INT X=X THEN LET A$=A$+"0"
120 LET X=INT X
130 IF X<>0 THEN GOTO 100
140 FOR A=1 TO LEN A$
150 LET B$=A$(A)+B$
160 NEXT A
170 PRINT Y;"= ";B$
180 GOTO 260
190 PRINT "CONVERSION FROM BIN. TO DEC."
200 INPUT A$
210 LET D=0
220 FOR A=1 TO LEN A$
230 IF A$(A)="1" THEN LET D=D+2**(LEN A$-A)
240 NEXT A
250 PRINT A$;" = ";D
260 PAUSE 4E4
270 CLS
280 RUN
```

Bin/dec
Anonymous


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Bomber

on Spectrum

This is a Spectrum version based on the popular arcade game. Your plane is circling over the city each time losing altitude. Your only chance is to bomb away the city and clear a space to land. Beware only one bomb may be dropped at a time so aim well!

The difficulty applies to the height of the skyscrapers and the descent rate determines how many passes you make at each level. I have never managed to win on Fast descent rate.

Use "space" to drop a bomb. The game uses a *For Next* loop (lines 70 and 90) for the position of the plane. I have used *Attr* for checking rather than *Screen$*, as the latter gives a null $ for user defined graphics.

```
  1 GO SUB 420: GO SUB 640
  2 LET sc=0
  5 LET b=0
  6 LET f=0: LET g=0
 10 CLS : BORDER 0: PAPER 0
 20 INK 6: CLS
 21 PRINT AT 21,0,"[redacted]
 22 INK 7
 30 FOR f=2 TO 29 STEP 3
 40 FOR g=20 TO 20-(RND*(d+6)
) STEP -1: PRINT BRIGHT 1,AT g,f
;CHR$ 144,CHR$ 144: NEXT g: PRIN
T AT g,f; BRIGHT 1;"  ": NEXT f
 50 LET a=1
 70 FOR f=0 TO 29
 75 IF ATTR (a,f+3)>63 THEN GO
TO 200
 80 PRINT INK 7;AT a,f;" >-"
 85 IF INKEY$=" " THEN IF b=0 T
HEN BEEP .05,0: GO TO 300
 86 IF b>0 THEN GO TO 320
 87 FOR v=1 TO 6: NEXT v
 90 NEXT f
 95 PRINT AT a,f;"    "
100 LET a=a+dr: IF a>=20 THEN G
O TO 600
110 GO TO 70
200 FOR i=1 TO 100
210 PRINT AT a,f;"**"
220 PRINT AT a,f;"++"
230 NEXT i
240 CLS
250 PRINT "You crashed!"
260 PAUSE 0
270 RUN
300 LET b=a
310 LET b1=f+2
320 PRINT AT b,b1;" "
330 LET b=b+1
335 IF b>20 THEN LET b=0: GO TO
 90
340 IF ATTR (b,b1)>63 THEN LET
sc=sc+1: PRINT AT 0,0;"Score=";s
c: GO TO 400
380 PRINT AT b,b1; INK 1;CHR$ 1
45: BEEP .01,40-b: GO TO 90
400 PRINT AT b,b1; INK 7;CHR$ 1
46
405 IF ATTR (b,b1-1)>63 THEN PR
INT INK 7: PRINT AT b,b1-1;CHR$
146;AT b-1,b1-1;" ": BEEP .1,10:
 LET b=0: GO TO 90
410 PRINT INK 7;AT b,b1+1;CHR$
146: PRINT AT b-1,b1+1;" ": BEEP
 .1,10: LET b=0: GO TO 90
415 FOR f=0 TO 7: READ x: POKE
USR "c"+f,x: NEXT f
420 FOR f=0 TO 7: READ x,y: POK
E USR "a"+f,x: POKE USR "b"+f,y:
 NEXT f: FOR f=0 TO 7: READ x: P
OKE USR "c"+f,x: NEXT f: RETURN
430 DATA 255,126,129,60,255,24,
129,60,255,126,129,126,255,90,12
9,24
440 DATA 0,0,34+128,63+128,45+1
29,63+128,126+45,192+60
600 PRINT AT 20,0;">-";AT 10,0;
"You landed!"
610 FOR f=1 TO 700: NEXT f: RUN

640 INPUT "Difficulty 1=easy 10
=hard ";d
650 IF d<1 OR d>10 THEN GO TO 6
40
655 INPUT "Rate of descent(1=fa
st,2=slow)?";dr
656 IF dr<1 OR dr>2 THEN GO TO
655
657 IF dr=2 THEN LET dr=.5
660 RETURN
```

Bomber
by Nick Wilson

Bugsplat

on Vic 20

Bugsplat is an interesting program for the unexpanded Vic-20. It is based on the game of Beetle where you have to build a beetle up by throwing a dice. When the computer tells you to stop the dice press the top function key. Then the computer will give you the corresponding part providing you have not got it already.

However, there is a catch. When you build your bug you must start with a body and build the pieces you gain directly on to it. If this is not possible then you cannot use the piece and must miss your go.

Lines with graphics are as follows

148 [HOM][REO][11CD][SHIFT O][3 COMMODORE SHIFT T][SHIFT P][CD][5CL][COMMODORE SHIFT G][3SPC][COMMODORE SHIFT M][CD][5CL]
145 [COMMODORE SHIFT G][3SPC][COMMODORE SHIFT M][CD][5CL][COMMODORE SHIFT G][3SPC][COMMODORE SHIFT M][CD][5CL][SHIFT L][3SPC][SHIFT @]

PROGRAM OF THE WEEK

```
0 REM BUGSPLAT BY M.MARTIN
5 DIMPT(1,5),DC$(5),PT$(5),MX(5)
10 POKE36879,110
20 PRINT"■      ■BUG SPLAT■"
30 PRINT"■ THE  OBJECT  OF  BUG■SPLAT  IS  TO BUILD UP",
35 PRINT"■A BUG  BY  THROWING  A■",
40 PRINT"DICE  AND  ADDING  THE■CORRESPONDING PIECE."
42 PRINT"■■■PRESS A KEY"
45 GOSUB1000
47 PRINT"■"
50 PRINT"■DICE  PIECE    NEEDED"
60 PRINT"——————————————————"
```

```
70 PRINT"  1    BODY         1"
80 PRINT"  2    NECK         1"
90 PRINT"  3    HEAD         1"
100 PRINT"  4    FEELERS      2"
110 PRINT"  5    TRAIL        1"
120 PRINT"  6    LEGS         6"
130 FORA=0TO5 READDC$(A) NEXT FORA=0TO5
135 READPT$(A) NEXT FORA=0TO5 READMX(A) NEXT
140 PRINT"____",
145 PRINT"|    ____|"
150 FORA=0TO5 PRINT""
155 POKE36878,15 POKE36876,220+A*5
160 PRINT"",DC$(A)
170 PT(0,A)=-1*(A<>3ANDA<>5)-2*(A=3)-6*(A=5)
180 GOSUB2000 FORB=1TO1000 NEXTB,A
190 POKE36876,0 POKE36878,0
200 PRINT"PRESS A KEY"; POKE198,0
210 GETA$ IFA$=""THEN210
220 POKE36879,93
225 PRINT""
230 GOSUB4000
240 FORA=0TO5 PT(0,A)=0 NEXT
250 PRINT"YOUR BUG" P1=0
260 PRINT"MY BUG" PL=1 GOSUB2000
261 B=0 FORA=0TO5 IFPT(1,A)=MX(A)THENB=B-1 NEXT IFB=-6THEN6000
262 DC=INT(RND(1)*6) POKE198,0
265 GOSUB4000
270 IFDC=6THENDC=0
272 PRINT""DC$(DC), DC=DC+1
275 PRINT"PRESS F1"
276 PRINT"TO STOP DICE"
277 POKE36878,15 POKE36876,RND(1)*128+128
280 GETA$ IFA$<>""THEN270
285 POKE36876,0
290 GOSUB4000 F1=2 DC=DC-1
300 GOSUB5000
370 PRINT"",
372 IFF1=0THENPRINT"YOU NEED A" PRINT"",PT$(DC)
375 IFF1=0THENPT(0,DC)=PT(0,DC)+1
380 IFF1=1THENPRINT"YOU DON'T    " PRINT"NEED A ",PT$(DC)
390 IFF1=2THENPRINT"YOU CAN'T " PRINT"HAVE A ",PT$(DC)
400 REM COMPUTER MOVES
405 FORA=1TO3000 NEXT GOSUB4000 P1=1
410 PRINT"MY MOVE"
420 PRINT"YOUR BUG"
430 PL=0 GOSUB2000 DC=INT(RND(1)*6)
435 B=0 FORA=0TO5 IFPT(0,A)=MX(A)THENB=B+1 NEXT IFB=6THEN6000
440 FORA=1TO50 PRINT""DC$(RND(1)*6) POKE36878,15
441 POKE36876,RND(1)*128+128 NEXT
442 POKE36878,0 POKE36876,0
445 GOSUB4000 PRINT"I'VE ROLLED" PRINT" A",DC+1
450 PRINT""DC$(DC)
460 FORA=1TO1000 NEXT GOSUB4000 F1=2
470 GOSUB5000
480 PRINT"",
485 IFF1=0THENPRINT"I NEED A" PRINT" ,PT$(DC)
490 IFF1=0THENPT(1,DC)=PT(1,DC)+1
500 IFF1=1THENPRINT"I DON'T" PRINT"NEED A ",PT$(DC)
510 IFF1=2THENPRINT"I CAN'T HAVE" PRINT"A "PT$(DC)
990 FORA=1TO3000 NEXT
```

Turn to page 20

from page 19

```
939 GOTO250
1000 GETA$ IFA$=""THEN1000
1010 RETURN
2000 IFPT(PL,0)=0THENRETURN
2010 PRINT"        ["
2020 IFPT(PL 1)=0THEN2040
2030 PRINT"      [""
2040 IFPT(PL,2)=0THEN2060
2050 PRINT"  ,  ["
2060 IFPT(PL,3)=0THEN2090
2070 IFPT(PL,3)=1THENPRINT"  ["
2080 IFPT(PL,3)=2THENPPINT" , ["
2090 IFPT(PL 4)=0THEN2110
2100 PRINT"/"
2110 IFPT(PL,5)=0THENRETURN
2120 PRINT' LEFT$("LLLLLL",PT(PL 5)) PRINT""
2999 RETURN
3000 DATA"           "
3010 DATA'          "
3020 DATA"          '
3030 DATA"          "
3040 DATA'          "
3050 DATA'          "
3060 DATABODY,NECK,NEAD,FEELER,TAIL,LEG,1,1,1,2,1,6
4000 PPINT'               "
4010 PRINT"              "
4020 PRINT"              "
4030 PRINT"              "
4040 PRINT"              '
4999 RETURN
5000 IFPT(P1,0)=0ANDDC=0THENF1=0
5005 IFPT(P1,0)=1ANDDC=0THENF1=1 RETURN
5010 IFPT(P1,0)=1ANDDC=1THENF1=0
5020 IFPT(P1,1)=1ANDDC=2THENF1=0
5030 IFPT(P1.2)=1ANDDC=3THENF1=0
5040 IFPT(P1,0)=1ANDDC=4THENF1=0
5050 IFPT(P1.0)=1ANDDC=5THENF1=0
5060 IFF1=0ANDRT(P1,DC)=MX(DC)THENF1=1
5999 RETURN
6000 GOSUB4000 IFB>0THENPRINT"YOU WIN" PRINT"ELL DONE'
6010 IFB<0TNENPRINT"I WIN" PRINT"BAD LUCK'
6020 FORA=1TO3000 NEXT
6030 GOSUB4000 PRINT'ANOTHER" PRINT" GO ?"
6040 GETA$
6050 IFA$="Y"THENRUN
6060 IFA$<>"N"THEN6040
6065 PRINT""
6070 END

READY
```

Bugsplat
by Mike Martin

Memory
on Vic20

This program for a Vic with 8K or 16K expansion will rearrange the Vic's memory to allow the use of a user-defined character generator. It moves the start of Basic to 8192 and the display file from 4096 to 7680 as on an unexpanded Vic. This leaves the area between 4096 and 7679 free for a new character generator or a machine code program.

The register 36869 is set to use the normal character set, but should be poked with 252 to use a defined character set. Having the character generator before the start of basic is an advantage because no memory has to be reserved and there is no chance of basic overwriting the characters.

No problems should occur if this program is run before loading the desired program.

Program

10	POKE 648 30 POKE 36866 150
20	POKE 641 0 POKE 642 32
30	POKE 36869 240
40	POKE 43 1 POKE 44 32
50	8152 0 PRINT (clr)
60	POKE CLR NEW

Program notes

Line(s)	
10	Move screen
20	Memory start
30	Normal Vic character set
40 to 50	Move start of basic

Memory
by Antony Collyer

Galaxy

on ZX81

This is a program for the ZX81 with 16K Ram. The program sets up a screenful of stable stars (inverse *) with ten target or unstable stars (graphics shifted A). In your spaceship (equals sign) you move around the galaxy, using the cursor keys, in an attempt to wipe out the unstable stars. Each unstable star destroyed gives five points; each stable star inadvertently wiped out costs one point.

Each time an unstable star is destroyed, a number of black holes are created. Falling into a black hole brings the game to a sudden end. Otherwise the game is ended by reaching the safety base inverse S which will give the final score together with the best possible score of 50.

Program notes.

Lines	
20 to 70	Gives instructions and explains the game
80 to 86	Completes instructions warning of the seven second blank-out of screen
100 to 198	The screen will be blank for approximately seven seconds whilst the program 1 Prints a black screen 2 Prints 115 stars in random positions 3 Places 10 targets in random places 4 Places the safety zone (inverse S) in a random position along the bottom line of the black screen. The program then returns to the SLOW mode
200 to 280	Gives loop for moving spaceship, checks position of spaceship, limits values of X and Y to width and height of screen. If line 265 shows that the spaceship has made a hit then the program goes to 500
400 to 430	Gives final score and ends game
500 to 550	Sends program to appropriate subroutine for value of W. (W = the object hit or point reached by spaceship.)
1000 to 1070	Subroutine for destroying unstable star, adds five to value of S, creates black holes in random positions, returns
2000 to 2010	Subroutine for destroying stable star, reduce S by 1, returns
5000 to 5030	Blacks out screen, ends game

```
  10 REM    GALAXY   EVE GORTON
  20 PRINT TAB 5, "ASSIGNMENT - TRASUEEPER-"
  30 PRINT AT 4,0, "YOU MUST TRAVEL TO GALAXY 308 TO DESTROY 10 UNSTABLE STARS WHICH HAVE APPEARED THERE"
  40 PRINT AT 8,0, "KEY - ",AT 8,4,"UNSTABLE STAR  STABLE STAR ",AT 10,4, "YOUR SHIP = ";AT 10,1
6" BLACK HOLE "
  50 PRINT AT 14,0, "SCORE - +5 FOR EACH   -1 FOR EACH  ". GO TO  TO RETURN TO BASE"
  60 PRINT AT 20,0, "PRESS 0 TO PREPARE FOR TAKE-OFF"
  65 IF INKEY$<>"0" THEN GOTO 65
  70 CLS
  80 PRINT AT 10,0, "PRESS 0 FOR YOUR 7-SECOND JUMP THROUGH HYPERSPACE"
  85 PRINT AT 16,0, "CONTROL KEYS - 5,6,7 AND 8"
  86 PRINT AT 20,0, "WATCH OUT FOR BLACK HOLES"
  88 IF INKEY$<>"0" THEN GOTO 96
 100 FAST
 105 FOR N=0 TO 20
 110 PRINT AT N,0, "                                "
 115 NEXT N
 120 LET S=0
 130 FOR L=1 TO 125
 130 LET Y=INT (RND*30)
 135 LET X=INT (RND*20)
 140 PRINT AT X,Y, "*"
 150 IF L>=116 THEN PRINT AT X,Y, "A"
 160 NEXT L
 170 LET F=INT (RND*10)+10
 180 PRINT AT 20,F, "S"
 190 SLOW
 200 LET X=1
 205 LET Y=1
 210 PRINT AT X,Y, "="
 215 PRINT AT X,Y, " "
 220 IF INKEY$="6" THEN LET X=X+1
 225 IF INKEY$="7" THEN LET X=X-1
 230 IF INKEY$="5" THEN LET Y=Y-1
 238 IF INKEY$="8" THEN LET Y=Y+1
 240 IF X<0 THEN LET X=0
 245 IF X>20 THEN LET X=20
 250 IF Y<0 THEN LET Y=0
 255 IF Y>30 THEN LET Y=30
 260 PRINT AT X,Y,
 265 LET W=PEEK (PEEK 16396+256*PEEK 16397)
 270 IF W=8 OR W=151 OR W=180 OR W=184 THEN GOSUB 500
 280 GOTO 210
 400 CLS
 410 PRINT AT 10,0, "YOUR FINAL SCORE ";S
 420 PRINT AT 12,0, "BEST POSSIBLE SCORE 50"
 430 STOP
 500 IF W=8 THEN GOSUB 1000
 510 IF W=151 THEN GOSUB 2000
 520 IF W=184 THEN GOTO 400
 550 IF W=128 THEN GOSUB 5000
 560 PRINT AT 21,0, "SCORE ";S,
 900 RETURN
1000 PRINT AT X,Y "="
1010 LET S=S+5
1020 FOR A=0 TO 5
1030 LET B=INT (RND*20)
1040 LET C=INT (RND*30)
1050 PRINT AT B,C, " "
1060 NEXT A
1070 RETURN
2000 LET S=S-1
2010 RETURN
5000 FOR N=0 TO 20
5010 PRINT AT N,0, "                                "
5020 NEXT N
5030 PRINT AT 10,1, "THIS IS A BLACK HOLE    GOODBYE"
```

GRAPHICS

line 40	UNSTABLE STAR = graphics shifted A STABLE STAR = inverse * BLACK HOLE = inverse O
line 110	32 inverse spaces
line 140	inverse *
line 150	graphics shifted A
line 180	inverse space
line 215	inverse space
line 5010	32 inverse spaces

Galaxy
by Eve Gorton

Maaaaga

on BBC Micro

Do you sometimes want to leave a message for someone to read if you are out? This program allows you to use your BBC Micro as an electronic message board. Your message can be up to 11 pages of about 200 characters per page long.

Just *Run* the program and give the recipients name. Follow this with the message terminating with a blank page. Following this the screen displays "FOR FREDS EYES ONLY" making a two-tone sound. Pressing the space bar pages through the message and back to the title.

Program notes

Lines 50 to 110 input the message

Lines 120 to 130 make the sound. (For a loud sound set last two *Envelope* parameters larger (up to 127))

Procspace waits for the user to press a key to page on

Line 170 stops the sound

Lines 180 to 280 page the message. The *Vdu 19* command is used to give background variety

```
 10 REM *****
 20 REM    MESSAGE PROGRAM
 30 REM      BY TONY LORD
 40 REM    (C) 22 AUG 82
 50 REM *****
 60 C%=0 MODE 5 DIM A$(20)
 70 INPUT "WHO IS THIS FOR ?" ''F$ IF LEN(F$)>19 THEN F$=LEFT$(F$,19)
 80 C%=C%+1
 90 CLS PRINT TAB(0,12) STRING$(20,"-"),
100 INPUT TAB(6,1) "TYPE HERE " A$(C%)
110 IF A$(C%)<>"" THEN GOTO 80
120 ENVELOPE 1,1,0, 20,0,75,1,75,127,0,0,-1,30,30
130 SOUND 1,1,101,255
140 CLS
150 PRINT TAB(9,4) "FOR"''STRING$((20-LEN(F$))/2, " ")
    F$,"S"'' TAB(6)"EYES ONLY"
160 PROCSPACE
170 SOUND 17,1,101,0 CLS
180 FOR Z%=1 TO C%
190 CLS VDU 19,0,Z% MOD 3,0,0,0
200 PRINT TAB(0,3)A$(Z%) IF A$(Z%)="" THEN PRINT TAB(4,3)
    "MESSAGE ENDS"
210 PROCSPACE
220 NEXT
230 GOTO 130
240 END
250 DEF PROCSPACE REM***
260 PRINT TAB(3,29)"PRESS SPACE TO"TAB (6,31)"CONTINUE",
270 REPEAT UNTIL INKEY$(10) <> ""
280 ENDPROC
```

Message
by Tony Lord

Fashioning by whimsy

In part three of our extract from The Working Spectrum we continue adding modules/subroutines to the Unifile program designed to enable a single program to cover a variety of filing tasks without the need for constant re-writing every time a new use comes along

MODULE 1.1.3

This is the module which permits Unifile to assume different shapes according to the whim of the user In the course of the module the major arrays and variables are set in preparation for the data to come Note that one result of this is that any previously stored data is lost We shall not discuss the use of the various arrays in detail here preferring to leave that task until we actually begin to use them

Commentary

Lines 1230-1340 A typical entry to the file might consist of name address age and telephone number In the course of these lines the program records how many such items there will be in each entry in the variable X The names of the items are requested and stored in the array A$, an indicator having been attached by the subroutine at line 2760 Note that we print Q$ stripped of its first character since the indicator is not a meaningful character

Line 1350 is the main array in which the entries will be stored

Line 1360 sets up two dummy entries which will mark the beginning and end of the file

Lines 1370-1380 Two examples of user defined functions which could just as well be replaced by single line subroutines The first function extracts the value of a pointer and will be explained in the course of Module 5 The second function extracts a single item from the main file based on the value of the indicator found at position C in the file

Line 1390 P is the variable used to record the first empty space in E$ E$ will always be 28 000 characters long but we will use only part of it Clearly we need to know how much is already in use

Line 1400 Y$ stores the pointers in the form of character codes a method that is discussed in relation to Module 5

Line 1410 N is the variable which records the number of entries in the file

Testing Module 1.1.3

We can now test Modules 2 and 3 Run the program and select function 1 from the menu You should be able to specify a number of items and then give them names Having done this stop and program and in direct mode print out the various arrays and variables as follows

B$??? COPY
Y$????
N 2
P 5

X should equal the number of items you specified and the array A$ should have X lines each containing an item name with an indicator tacked on to the front

MODULE 1.1.4

The purpose of this module is to accept the input of an entry composed of the correct number of items and to present that entry to the section of the program which will insert it into its correct place in the file

Commentary

Line 1600 R$ is the entry and is composed of a number of successive Q$s added together

Testing Module 1.1.4

If you have already entered some sensible item names then start the program with *Goto 1* and call up function 2 from the menu You should be asked for an input for each item name After the correct number of item names the program will stop with the report 0 OK 1630 1 The file size should be 4/28000 and, if you print out R$ it should consist of your items, each preceded by an indicator character ■

More of the Unifile program will be presented next week

This is an extract from The Working Spectrum, by David Lawrence (price £5.95) published by Sunshine Books Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

UNIFILE. *Module 3*

```
1200 REM ***********************
1210 REM ENTRY STRUCTURE
1220 REM ***********************
1230 PRINT PAPER 2,"          FILE
 STRUCTURE          "
1240 PRINT '"HOW MANY ITEMS IN E
ACH ENTRY?"
1250 INPUT X
1260 CLS
1270 DIM A$(X,20)
1280 PRINT PAPER 2,"         NAMES
 OF ITEMS          "
1290 FOR I=1 TO X
1300 PRINT "ITEM ";I;" ";
1310 GO SUB 2760
1320 PRINT Q$(2 TO )
1330 LET A$(I)=Q$
1340 NEXT I
1350 DIM E$(28000)
1360 LET B$(1 TO 4)=CHR$ 2+CHR$
0+CHR$ 2+CHR$ 255
1370 DEF FN A()=256*CODE Y$(2*S-
1)+CODE Y$(2*S)
1380 DEF FN A$()=E$(C TO C+CODE
E$(C)-1)
1390 LET P=5
1400 LET Y$=CHR$ 0+CHR$ 1+CHR$ 0
+CHR$ 3
1410 LET N=2
1420 RETURN
```

UNIFILE *Module 4*

```
1430 REM ***********************
1440 REM NORMAL INPUT
1450 REM ***********************
1460 LET R$=""
1470 PRINT PAPER 2;"          EN
TRIES          "
1480 PRINT '"COMMANDS AVAILABLE
"
1490 PRINT ">ENTER ITEM SPECIFI
ED" '">""ZZZ"" TO QUIT"
1500 PRINT "*********************
***********"
1510 PRINT "FILE SIZE ",P-1;"/";
LEN E$
1520 FOR I=1 TO X
1530 GO SUB 2810
1540 GO SUB 2760
1580 PRINT Q$(2 TO )
1590 IF Q$(2 TO )="ZZZ" THEN RET
URN
1600 LET R$=R$+Q$
1610 NEXT I
1620 CLS
1630 GO SUB 1660
1640 GO TO 1440
```

Whorled graphics

***Simon Cross** presents a spiral printing routine for the ZX81*

This program is a 114 byte machine code routine which prints a character chosen by the user in a 'spiral' form from the edge of the screen to the centre. It runs on the Sinclair ZX81 with more than 3¼K (with slight modification it will run on the unexpanded ZX81). The program produces a 32 x 24 display on the ZX81 with more than 3¼K — in the unexpanded ZX81 the display is 32 x 22.

Initially, I wrote this routine to be used as a 'fancy' *Cls* routine to brighten up some of my Basic programs, but I think that it has enough intrinsic interest to be the core of a "pattern-making" program.

The routine is quite simple consisting of a main loop which itself contains four smaller loops which print the four edges of the pattern. I needed to put a delay loop between each printing of a character since without these the pattern appeared to be printed instantaneously. The character to be printed on to the screen is stored in location 16514. The rest of the routine could be relocated in the memory since it contains no absolute jumps.

To enter the machine code, first *Poke* the code into a Rem statement in line 1 which contains 114 characters. Most readers have probably developed their own methods of entering machine code by now, but I have included my own loading program. After this program has been entered it should be Run and the machine code entered one byte at a time. The address and entered code will be scrolled up the screen.

The short demonstration program prints various randomly selected characters on to the screen and can be enjoyed as a "pattern-making" program. Just enter the Basic program once the machine code has

[illegible]	HEX CODE	MNEMONIC	NOTES
16514	00		location storing character to be printed
	21 0C 40	LD HL (16396)	load HL with DFILE pointer
	5E	LD E (HL)	
	23	INC HL	
16520	56	LD D (HL)	
	21 00 00	LD HL (0)	
	19	ADD HL DE	HL now contains address of 1st byte display
	01 82 40	LD DE (16514)	load address which contains character to be printed
	1A	LD A (DE)	
16529	16 21	LD D (33)	load D with row length variable
	1E 16	LD E (22)	load E with column length variable
	06 0B	LD B (11)	load B with counter for main loop
	C5	PUSH BC	start of main loop
	15	DEC D	
	42	LD B D	load row length into loop counter
	23	INC HL	start of upper row print loop
	77	LD (HL) A	print a character onto the screen
[illegible]	C5	PUSH BC	
	06 FF	LD B (255)	
	10 FE	DJNZ (-2)	delay loop
	C1	POP BC	
	10 F6	DJNZ (-10)	end of upper row print loop
	1D	DEC E	
	43	LD B E	load column length into loop counter
[illegible]	C5	PUSH BC	start of R/H column print loop
	06 21	LD B (33)	
	23	INC HL	
	10 FD	DJNZ (-3)	
	C1	POP BC	
	77	LD (HL) A	print a character onto the screen
	C5	PUSH BC	
[illegible]	06 FF	LD B (255)	
	10 FE	DJNZ (-2)	delay loop
	C1	POP BC	
	10 F0	DJNZ (-16)	end of R/H column print loop
	15	[illegible]	
	42	LD B D	load row length into loop counter
	2B	DEC HL	start of lower row print loop
	77	LD (HL) A	print a character onto the screen
[illegible]	C5	PUSH BC	

been *Poked* into the *Rem* statement and then Run the whole program. To use the routine in any other program, *Poke* the decimal code of the character to be printed into location 16514. The routine is called by *Rand Usr* 16515.

1K ZX81 modifications

The collapsed display file needs to be filled out before *Poking* characters into it. Add the following lines to the pattern-making program

```
5 FOR N = 0 TO 21
6 PRINT  —32 spaces—
7 NEXT N
```

Since I do not know a simple way of filling out the bottom two lines of the display file I reduce the display to 32 x 22 by altering the machine code with the following direct commands

```
POKE 16532, 22
POKE 16534 19
```

Initial program to load machine code

```
 1 REM  XXXXXXXXXXX—total of 114 Xs—
   XXXXXXXXXXXXX
10 FOR N = 16514 TO 16627
20 INPUT A$
30 LET A = 16 * CODE (A$) + CODE (A$(2)) — 476
40 POKE N A
50 SCROLL
60 PRINT N      A$
70 NEXT N
80 SCROLL
90 PRINT  END
```

Program to demonstrate machine code routine

```
  1 REM machine code routine
 10 LET X = 1 + RND * 10
 20 LET Y = 128 + RND * 15
 30 POKE 16514 X
 40 RAND USR 16515
 50 POKE 16514 128
 60 RAND USR 16515
 70 POKE 16514 Y
 80 RAND USR 16515
 90 POKE 16514 0
100 RAND USR 16515
110 RAND
120 GOTO 10
```

■

ADDRESS	HEX CODE	MNEMONIC	NOTES
	06 FF	LD B (255)	
	10 FE	DJNZ (-2)	delay loop
	C1	POP BC	
	10 F6	DJNZ (-10)	end of inner row print loop
	1D	DEC E	
	43	LD B E	load column length into loop counter
16540	C5	PUSH BC	start of 1/8 column print loop
	06 21	LD B (33)	
	2B	DEC HL	
	10 FD	DJNZ (-3)	
	C1	POP BC	
	77	LD (HL) A	print a character onto the screen
	C5	PUSH BC	
16589	06 FF	LD B (255)	
	10 FE	DJNZ (-2)	delay loop
	C1	POP BC	
	10 F0	DJNZ (-16)	end of 1/8 column print loop
	C1	POP BC	
16597	10 C0	DJNZ (-64)	end of main loop
	15	DEC D	start of fill centre routine
16600	42	LD B D	load loop counter with row length
	23	INC HL	
	77	LD (HL) A	print a character onto the screen
	C5	PUSH BC	
	06 FF	LD B (255)	
	10 FE	DJNZ (-2)	delay loop
	C1	POP BC	
16608	10 F6	DJNZ (-11)	
	06 21	LD B (33)	
	23	INC HL	
	10 FD	DJNZ (-3)	
	42	LD B D	
	77	LD (HL) A	print a character onto the screen
	2B	DEC HL	
	C5	PUSH BC	
16620	06 FF	LD B (255)	
	10 FE	DJNZ (-2)	delay loop
	C1	POP BC	
	10 F6	DJNZ (-10)	end of fill centre routine
16627	C9	RET	return to Basic

Hex dumper

***Paul Murton** creates a hex dump which enables you to inspect memory blocks.*

This short program creates a hex dump on the Dragon 32

On running you are asked to enter the start and end addresses of the memory you wish to inspect The hex is then displayed in blocks of 120

When you have inspected each block, press the space bar and the next block of 120 will appear

Those lucky enough to own a printer need only replace lines 200 and 210 and insert a subroutine to copy the contents of the screen to the printer

```
READY.

 10 CLS:PRINT"          HEX DUMP"
 20 PPINT"ENTEP START ADDPESS (DEC)":INPUT A
 30 FRINT"ENTRER END ADDRESS (DEC)":INFUT B
 40 CLS:FOR N=A TO B STEP 8:Y=Y+1
 50 PPINTHEX$(N);"  ";
 60 FOR J =0TO 7
 70 PRINTHEX$(FEEK(N+J));" ":
 80 NE TJ
 90 FRINT
 100 IFY/15=INT(Y/15)THEN GOSUB 200
 120 NEXTN
 130 GOTO130
 200 A$INKEY$:IF A$<>" "THEN 200
 210 CLS:RETURN
READY.
```



Beaufort scale

***Robert Coates** presents a spacecraft landing program complete with wind*

The aim of the game is to land your spacecraft on the landing pad on earth, just to the right of the flag

The spacecraft starts at a random position at the top of the screen and automatically descends There is also a strong wind blowing from the right which pushes your craft to the left

To counteract the wind, press the spacebar This moves your craft to the right and enables you to land

If the landing is successful then the game starts again with your craft in a different position If unsuccessful, then the game ends

To increases the difficulty, change line 180 to read

180 x = x − 0 6 (or any other increment)

```
10 L = 0
20 DIM R(14,14)
30 PMODE 3,1 SCREEN 1,0  PCLS  COLOR 2,3
40 X = RND (150) + 25  Y = RND (10)
50 R$ = "BM 105,27, H2E2R543H2L1G2D3R5F2G2
60 T$ = "BM0,164,F4E3F7R2E4F5R6E6R15F6
   R16E7F4E6F3E2F5R3E3F4R4E6F4R4E10F4
   E3F8R10E19F10E7F10R15E20U15E7
70 PAINT (0 0),4
80 DRAW R$  DRAW T$
90 DRAW "BM39, 165, U6L4D3R4"
100 GET (101,13) − (115,27),R,G
110 X = X + 1
120 IF INKEY$ = "      THEN 160
130 Y = Y + 0 5
140 IF Y = 153 THEN 210
150 GOTO 180
160 PUT (X Y) − (X+14,Y+14),R,PSET
170 GOTO 110
180 X=X − 0 4
190 PUT (X,Y) − (X+14,Y+14), R,PSET
200 GOTO 120
210 IF X>40 AND X<48 THEN 220 ELSE 290
220 PMODE 1,1  SCREEN 0,0  PCLS
230 L= L+1
240 CLS (6)
250 PRINT @ 192, "CONGRATULATIONS"
260 PRINT @ 224, "SUCCESSFUL LANDINGS" ,L
270 FOR N=1 to 800  NEXT N
280 GOTO 30
290 PMODE 1,1 SCREEN 0,0  PCLS
300 CLS (6)
310 PLAY "T20" + "ABCDCBAGFAEDDAFBC
320 PRINT @ 192, "GAME OVER"
330 FOR N = 1 to 1000  NEXT N
```

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

BIAS ACCUSATION UNWARRANTED

R McConachie of Middlesbrough Cleveland has sent a long letter accusing me (and most of the rest of the British computer press) of bias against the Atari computers. He refers mainly to my comments in Popular Computing Weekly *October 7. The main points of his letter are as follows*

Q **The Atari does not have a *Verify* command as such, but the same effect can be achieved by first *Listing* the program to tape and then *Entering* it back into the computer's memory. Not as convenient as a straightforward *Verify*, but it does serve the purpose. The Atari does not have a flashing ability but it does have luminences which are a more than adequate replacement.**

A user defined graphics function? I don't know what it does on a Spectrum, but player missile graphics must count as the same thing. The Atari can in fact also display 192 colours.

I feel that patriotic fervour (what about the Vic?), seems to be leading to a very blinkered attitude on the part of the British press. I spent over 12 months researching the computer market before I bought an Atari. There are a few things that it cannot do that others can — how I would like a *Get* command for example. But this definitely works the other way round as well.

A Before I address myself to the important question of bias, I would like to clear up one point. The correct number of luminence levels is 16, not eight or 15.

I do not think that the fundamental quality of the Atari machines is really in doubt — their sound and graphics capabilities are excellent. Where I feel that disenchantment does creep in is the way the Atari user is tied to a small group of dealers. This is especially noticeable when the Atari market is compared to the wide open Sinclair market. It is easy to say that the customer has a lot of support and that the Atari is a modular system, but the customer will pay a great deal more for those modules than he would with another computer.

Perhaps it is partly jealousy that so many goodies seem to be locked up in the Atari in such a way that many users find them hard to get without paying a lot of money. Yet many similar goodies are available for other micros at much lower cost.

The Atari 400 does cost £200, but I have come across more than one person who has saved his money to buy an Atari computer, only to find that it is useless because he has no money left to buy any games and cannot program it because he has not got another £35 or £40 to buy the Rom.

SIGNIFICANT IMPROVEMENTS

Linda Crowther of Jubilee Drive, Thornbury, Avon writes

Q **I am hoping to buy a Spectrum early next year (when the bugs have been sorted out) but in the meantime I am hoping to get a cassette player for Christmas. Do you know of one that will work well with the Spectrum, and that will also play music tapes? I know you covered this in September, but I would like some more details.**

A This is also for James March of Sheffield and P Douglas of Falkirk. It seems as though some of Uncle Clive's chickens are coming home to roost. For all those worried about *Load/Save* on the Spectrum, don't.

Whatever the faults on the Spectrum, this is one area where very significant improvements have been made. Any domestic cassette player with jack sockets for the ear and mic should work.

If you want a particular model, then Data-assette sell a Ferguson model which we use here in the office for both the ZX81 and the Spectrum. It can also play conventional cassettes, and has so far worked well in both the *Load/Save* and conventional audio roles. Data-assette is at 44 Shroton Street, London NW1 6UG.

ACE AND THE FORTH CHALLENGE

Paul Purvis of Preston, Lancashire writes

Q **I have seen the advertisements for the Jupiter Ace and, like a lot of other ZX81 owners, I am very interested in the challenge that Forth would offer. However, I am worried that the small faults which dogged the ZX81 will also plague the Ace. Namely, loose jack sockets and I/O connectors, poor *Loading* and *Saveing*, and just the general delicacy of the ZX81. I accept that a computer is not a robust toy, but it must be able to withstand a certain amount of wear and tear. Also I know the keyboard is meant to be a proper one, but does this mean 'proper' in the sense of the Spectrum keyboard?**

A To a certain extent only time can fully answer your questions. However, the Ace is more robust than the ZX81. The jack sockets if anything are too tight. It is quite possible to lift the Ace up and shake it in the air without any chance of the plugs becoming disconnected even for a moment. As yet there are no add-ons for the I/O port, so I cannot say how good the connections will be.

Again, until it is thoroughly tested the *Load/Save* facilities cannot be judged. But it does seem as though the signal has been inverted, because the instructions that come with the computer tell you to turn the tone right down. Remember the designers of the Ace were also responsible for the Spectrum, and the *Load/Save* on this is excellent.

The keyboard on the Ace is the same type as the Spectrum's, but the rubber is stiffer and the keys have a small peg underneath to make contact easier. For people used to the ZX81, and even the Spectrum, the positive response of the keys on the Ace will be very welcome.

It is a less delicate machine than the ZX81. However, such terms are relative and, like all computers, it is not designed to be battered or thrown around.

NON-APPEARING CURSOR

A Campbell of Arabella Drive, Roehampton writes

Q **For the last few weeks, every time I try and turn on my ZX81 I get a plain screen, with no Cursor. I have tried the computer with and without the 16K Ram Pack, but I get the same response. I have an IVM attached but the computer started to go wrong before this was done. Please could you advise me on what to do?**

A By IVM I presume you mean an inverse video module. You do not make it clear whether or not the problem has been worse since this has been fitted. I have met this problem from time to time and have rectified it by simply pulling out the jack plug for a little while.

However, it is possible that you have had two faults run into each other. I do not know which inverse graphics modules you have, but if it is Haven's, try making a small adjustment to the potentiometer, which does have a screw slot. I would suggest that you do this with a small piece of wood, to be on the safe side.

There is also a chance that the power supply is not stable enough. A 0.1 microfarad polystyrene resistor across the power supply should sort out this problem.

If none of this works, then you may have shorted out the video lead. The type of screen response you are getting means the computer is working, but the video signal is not getting through. You will have to try removing the IVM to see if you can get the cursor back without it. If you get no response then you will have to consider a new computer, because the fitting of the module will almost certainly have voided your guarantee.

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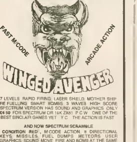
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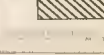
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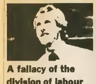
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A fallacy of the division of labour

If it takes three days for 12 politicians to dig four holes in the ground how long does it take for 15 politicians to dig half a hole?

The answer: it is not possible to dig half a hole for a hole is a hole be it ever so shallow. We might have asked how many holes the coalition could dig in a day, and the answer would not have been 5.3 holes.

Sometimes the article with which we are working is not amenable to simple quantitative notions. Hole is not an easily quantified object though holes of specified dimensions can easily be specified. There are 20 000 holes in Blackburn Lancashire. How many holes would it take to fill the Albert Hall?

Frederick P Brooks Jr writes (in *The Mythic al Man-month* 1972) that to add more people to the production of a piece of software does not usually shorten the time taken to complete it. In fact, adding people *extends* the time needed to complete it. Software production is a human exercise in complex relationships, for every person needs to know something of what the others are doing. Even if the project has been partitioned into small segments to save time, adding more people means that communication time has to increase, and adding more men then lengthens not shortens the schedule.

The 'mythical man-month' of Brooks title is the assumption that if it takes 12 man months to produce an item of software it is possible to employ *either* 12 people for 1 month *or* 1 person for 12 months whereas it might take 12 people *6* months in reality.

Brooks makes the point that though the division of labour works in conventional manufacturing — making metal pins for example — this is not true of products of the mind. He says:

Men and months are interchangeable commodities only when a task can be partitioned among many workers *with no communication among them*.

When making pins or electronic gadgets, there is very little need for communication — but this cannot be said of software production or the design of new gadgets. The Apple II computer was designed by two men (one hardware, one software), the Sinclair series has been designed by small teams, the Osbourne 1 is the result of one man's vision, and the story is being repeated all the time in the UK and USA.

Japan is the world leader in manufacturing gadgets, a fact with which governments are only too well acquainted. The Japanese strength is in producing and improving goods which others have designed and invented more cheaply than they themselves are able. The Japanese reputation for innovation is mostly a reputation for improvement. Their position as leader in the production of cheaper gadgets is now under attack from many other countries (including Hong Kong, Singapore and Taiwan) who can produce pins more cheaply.

The nature of Japanese society is bureaucratic, paternalistic and deferential, and the individual tends to be lost. As there has been so little good software produced by the Japanese perhaps we might postulate that this is the reason? To create pins (or gadgets) requires efficiency and the man month argument fits. To create intellectual products requires a more complex approach to people. Programmers are not assembly line workers. The Japanese government has realised that others will undercut them in production so they have set up the Fifth Generation Project. To speed up the production of software they are employing thousands of people. ■

Boris Allen

Puzzle

Expressing squares in twos

Puzzle No 33

Fifty is the smallest number that can be expressed as the sum of two squares in two different ways: seven squared plus *one* squared or twenty five squared plus twenty-five squared.

What are the next three higher numbers that can be formed in the same way as the sum of two squares in two ways?

Solution to Puzzle No 28

We must find a number *N* which when divided into each of the four numbers given (1702, 3064, 5334 and 6686) produces the same remainder. In the program below the value *N* is repeatedly subtracted from the first of the numbers until the remainder *R* is found. This value is then subtracted from each of the other three numbers and each is tested to see if it is a multiple of *N*. Since the highest value is required, *N* is started at 1702 and is decremented by one each time the loop is run.

```
10 FOR N = 1702 TO 1 STEP - 1
20 LET R = 1702 - N
30 IF R < 0 THEN LET R = R + N
40 LET A = 3064 - R
50 LET B = 5334 - R
60 LET C = 6686 - R
70 IF A/N - INT (A/N)<>0 THEN GOTO 120
80 IF B/N - INT (B/N)<>0 THEN GOTO 120
90 IF C/N - INT (C/N)<>0 THEN GOTO 120
100 PRINT N
110 STOP
120 NEXT N
```

This gives us the answer of 454 leaving in each case a remainder of 340.

Winner of Puzzle No 28

The winner is J P Mensink, Acomb Crescent, Newcastle-upon Tyne, who receives £10.

Top Sellers



Atari

1	Jumbo Jet Pilot	(Thorn EMI)*
2	Submarine Commander	(Thorn EMI)*
3	Soccer	(Thorn EMI)*
4	Preppie	(Adventure International)
5	Claim Jumper	(Synapse)
6	Air Strike	(English Software)
7	Diskey	(Adventure International)†
8	Alien Swarm	(Meteor Software)
9	Snooker/Billiards	(Thorn EMI)*
10	Frogger	(Sierra On-line)

*Cartridge †Disc only
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

ZX Spectrum

1	Invaders	(Bug-Byte)
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3	Orbiter	(Silversoft)
4	Sea Trek	(Chromasoft)*
5	Meteor Storm	(Quicksilva)
6	Masterfile	(Campbell Systems)
7	Maze Man	(Abbersoft)
8	Gulpman	(Campbell Systems)
9	Spectrum Chess	(Artic)*
10	Personal Banking	(J P Gibbons)*

*Requires 48K.
(Figures compiled by Buffer Micro Shop, London 01 769 2887)

ZX81*

1	Gauntlet	(Colourmatic)
2	Frogger	(DJL Software)
3	3D Defender	(JK Greye)
4	Sea War	(Panda)
5	Gulp II	(Campbell Systems)
6	Monster Maze	(JK Greye)
7	Subspace Striker	(Pixel)
8	Maze Man	(Abbersoft)
9	Chess I	(Artic)
10	Defence	(Campbell Systems)

*All require 16K Ram
(Figures compiled by Buffer Micro Shop, London 01 769 2887)

Vic

1	Sargon II Chess	(Commodore)*
2	Defenda	(Llamasoft)†
3	Super Expander	(Commodore)*
4	Blitz	(Commodore)
5	Spiders of Mars	(Audiogenic)*
6	Jellymonsters	(Commodore)*
7	Star Battle	(Commodore)*
8	Grid Runner	(Llamasoft)
9	Traxx	(Llamasoft)†
10	Scramble	(Rabbit)

*Cartridge †Requires 8K or 16K.
(Figures compiled by the Vic Centre, London 01 992 9904)

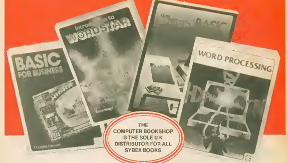
Books

1	Starting Forth *Brodie*	(Prentice Hall)
2	ZX Spectrum Explored *Hartnell*	(Sinclair Browne)
3	BBC Micro Revealed *Ruston*	(Interface)
4	ZX81 Users Handbook *Terrell and Simpson*	(Newnes)
5	Easy Programming for the ZX Spectrum *Stewart and Jones*	(Shiva)
6	Z80 Assembly Language Programming *Leventhal*	(Osborne)
7	Over the Spectrum *various authors*	(Melbourne House)
8	Programming the 6502 *Zaks*	(Sybex)
9	Machine Code and Better Basic *Stewart and Jones*	(Shiva)
10	Atari Sound and Graphics *Moore*	(Wiley)

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